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Job No.: CTCE/BBMP/W.No.09/KRIDL/WMM/Gradation/2013-14 03.01.2014

GRADATION FOR WMM
MORTH TABLE-400-11

Client : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Technical Manager,** KRIDL, Bangalore.

Name of Work : Improvements to Srinidhi Layout, Sapthagiri Layout and Deemandrala Layout Roads in Ward No.09 of Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : EE/BTP/BBMP/W.O/339/2012-13 Dated: 28.02.2013

Date of Testing : 03.01.2014

Material : WMM

Sample Location : WMM Mix Plant Oven Dry Wt (gm): **7490**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	135	135	1.8	98.2	95-100
22.4	2515	2650	35.4	64.6	60-80
11.2	1205	3855	51.5	48.5	40-60
4.75	865	4720	63.0	37.0	25-40
2.36	980	5700	76.1	23.9	15-30
0.600	525	6225	83.1	16.9	8-22
0.075	980	7205	96.2	3.8	0-8

Note:

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Job No.: CTCE/BBMP/W.No.09/KRIDL/WMM/Gradation/2013-14

06.01.2014

GRADATION FOR WMM
MORTH TABLE-400-11

Client : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Technical Manager,** KRIDL, Bangalore.

Name of Work : Improvements to Srinidhi Layout, Sapthagiri Layout and Deemandrala Layout Roads in Ward No.09 of Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : EE/BTP/BBMP/W.O/339/2012-13 Dated: 28.02.2013

Date of Testing : 06.01.2014

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **7985**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	155	155	1.9	98.1	95-100
22.4	2450	2605	32.6	67.4	60-80
11.2	1285	3890	48.7	51.3	40-60
4.75	1020	4910	61.5	38.5	25-40
2.36	955	5865	73.5	26.5	15-30
0.600	685	6550	82.0	18.0	8-22
0.075	950	7500	93.9	6.1	

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Job No.: CTCE/BBMP/W.No.09/KRIDL/WMM/AIV/2013-14

03.01.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the Work	Improvements to Srinidhi Layout, Sapthagiri Layout and Deemandrala Layout Roads in Ward No.09 of Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/W.O/339/2012-13 Dated: 28.02.2013
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	03.01.2014

Sl No.	Details	Trial No.		Average
		1	2	
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	385	386	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	85	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	301	
4	Aggregate Impact value = percent fines	21.82	22.02	
	100* (W_2/W_1)%			21.92

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.09/KRIDL/WMM/S-T/2013-14 03.01.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Work	Improvements to Srinidhi Layout, Sapthagiri Layout and Deemandrala Layout Roads in Ward No.09 of Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/W.O/339/2012-13 Dated: 28.02.2013
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	03.01.2014

Result : Flakiness Index = **11.06%**

Elongation Index = **13.25%**

Result : Combined Flakiness & Elongation index 24.31%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.09/KRIDL/SDBC/AIV/2013-14

16.01.2014

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP,
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the Work	Improvements to Srinidhi Layout, Sapthagiri Layout and Deemandrala Layout Roads in Ward No.09 of Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/W.O/339/2012-13 Dated: 28.02.2013
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	16.01.2014

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	378	380	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	78	79	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	300	301	
4	Aggregate Impact value = percent fines	20.63	20.79	
	$100^* (W_2/W_1)\%$			**20.71**

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/W.No.09/KRIDL/SDBC/Shape_T/2014-15 : 16.01.2014

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Client	: **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager,** KRIDL, Bangalore.
Name of Work	: Improvements to Srinidhi Layout, Sapthagiri Layout and Deemandrala Layout Roads in Ward No.09 of Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	: EE/BTP/BBMP/W.O/339/2012-13 Dated: 28.02.2013
Technical Reference	: IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 16.01.2014

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Result : Flakiness Index = **12.35%**

Elongation Index = **13.10%**

Result : Combined Flakiness & Elongation index **25.45%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.09/KRIDL/SDBC/Stripping/2013-14 16.01.2014

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the work	Improvements to Srinidhi Layout, Sapthagiri Layout and Deemandrala Layout Roads in Ward No.09 of Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/W.O/339/2012-13 Dated: 28.02.2013
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	16.01.2014

Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.1	3.20	96.80
2	3.2		
3	3.3		

Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.09/KRIDL/SDBC/Sp_Wa/2013-14 16.01.2014

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the Work	Improvements to Srinidhi Layout, Sapthagiri Layout and Deemandrala Layout Roads in Ward No.09 of Vidyaranyapura Sub Division, BBMP, Bangalore.
Reference	EE/BTP/BBMP/W.O/339/2012-13 Dated: 28.02.2013
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	16.01.2014

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2023	2024	2025	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1268	1269	1270	
4	Weight of saturated surface dry aggregate in air	W_3 g	2015	2014	2013	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	747	745	743	
6	Weight of oven dried aggregate	W_4 g	1999	2000	2001	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.676	2.685	2.693	2.685
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.735	2.736	2.737	2.736
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.80%	0.70%	0.60%	0.70%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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Job No.: CTCE/BBMP/W.No.09/KRIDL/WMM/Gradation/2013-14

03.01.2014

GRADATION FOR WMM
MORTH TABLE-400-11

Client : **Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.

Agency : **Technical Manager,** KRIDL, Bangalore.

Name of Work : Improvements to Srinidhi layout, Sapthagiri layout and Deemandala layout roads in Ward No.09 of Vidyaranyapura Sub Division, BBMP, Bangalore.

Reference : EE/BTP/BBMP/W.O/339/2012-13 Dated: 28.02.2013

Date of Testing : 03.01.2014

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **7950**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	210	210	2.6	97.4	95-100
22.4	2750	2960	37.2	62.8	60-80
11.2	1500	4460	56.1	43.9	40-60
4.75	985	5445	68.5	31.5	25-40
2.36	900	6345	79.8	20.2	15-30
0.600	750	7095	89.2	10.8	8-22
0.075	560	7655	96.3	3.7	0-8

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ಯಲಹಂಕ ವಲಯ,
ಬಿ.ಬಿ.ಎಂ.ಪಿ., ಬೆಂಗಳೂರು-92.

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GRADATION FOR WMM
MORTH TABLE-400-11

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Agency : **Technical Manager,** KRIDL, Bangalore.

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Reference : EE/BTP/BBMP/W.O/339/2012-13 Dated: 28.02.2013

Date of Testing : 06.01.2014

Material : WMM

Sample Location : WMM Mix Plant Oven Dry Wt (gm): **8695**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	300	300	3.5	96.5	95-100
22.4	2805	3105	35.7	64.3	60-80
11.2	1495	4600	52.9	47.1	40-60
4.75	1025	5625	64.7	35.3	25-40
2.36	1020	6645	76.4	23.6	15-30
0.600	985	7630	87.8	12.2	8-22
0.075	650	8280	95.2	4.8	0-8

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Job No.: CTCE/BBMP/W.No.09/KRIDL/SDBC/Bitumen/2013-14 16.01.2014

BITUMEN CONTENT AND GRADATION DETERMINATION OF SEMI DENSE BITUMINOUS CONCRETE MIX

As per IS2386 and IRC:SP:11-1984

Client	**Asst. Executive Engineer,** Vidyaranyapura Sub Division, BBMP, Bangalore.
AGENCY	**Technical Manager,** KRIDL, Bangalore.
NAME OF THE WORK	Improvements to Srinidhi layout, Sapthagiri layout and Deemandala layout roads in Ward No.09 of Vidyaranyapura Sub Division, BBMP, Bangalore.
REFERENCE	EE/BTP/BBMP/W.O/339/2012-13 Dated: 28.02.2013
SAMPLE I/D	Roads in Srinidhi layout, Sapthagiri layout and Deemandala layout roads in Ward No.09,BBMP, Bangalore.
DATE OF TESTING	16.01.2014

BITUMEN CONTENT DETERMINATION

Description	Trail 1	Trail 2
1. Weight of Mixture before Test, g	500	500
2. Weight of Mixture after Test, g	475	474
3. Weight of Asphalt and Mineral matter Extracted,	-	-
4. Weight of Mineral Matter, g.	-	-
5. Weight of Ash, g		
6. Weight of Bitumen Extracted, g. (corrected)	25	26.00
7. Bitumen content in %	5.00	5.20
8. Average	**5.10**	

GRADATION AFTER EXTRACTION

SIEVE SIZE	Trail 1				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	34.26	7.21	7.21	92.79	90-100
4.75	255.6	53.81	61.02	38.98	35-51
2.36	34.52	7.27	68.29	31.71	24-39
1.18	35.64	7.50	75.79	24.21	15-30
0.3	41.33	8.70	84.49	15.51	9-19
0.075	49.35	10.39	94.88	5.12	3-8

SIEVE SIZE	Trail 2				JOBMIX
mm	Weight Retained, gm	% Retained	%Cummulative Retained	% Passing	Gradation
13.2	0	0	0	100	100
9.5	35.62	7.12	7.12	92.88	90-100
4.75	259.8	51.96	59.08	40.92	35-51
2.36	61.22	12.24	71.33	28.67	24-39
1.18	46.32	9.26	80.59	19.41	15-30
0.3	35.21	7.04	87.63	12.37	9-19
0.075	32.25	6.45	94.08	5.92	3-8

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